

## Original Article

# A study of complementary feeding practices among higher educated mothers in north-western part of Rajasthan

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## ABSTRACT

**Background:** Infants and young children are at an increased risk of malnutrition from 6 months of age onward when breast milk alone is no longer sufficient to meet all their nutritional requirements and complementary feeding should be started. **Objective:** This study was undertaken to assess the practices of complementary feeding and knowledge of infant milk substitute (IMS) act in higher educated mothers. **Materials and Methods:** This hospital-based cross-sectional descriptive study was conducted in a medical college of Rajasthan from January to December 2015. Totally, 300 mothers with graduate/post-graduate degree whose children were between 9 and 15 months of age, were included in the study. All the mothers were interviewed as per the standardized pro forma regarding the complementary feeding practices. **Results:** Maximum numbers of mothers were homemakers (67.3%) as compared to employed (32.7%). In the present study, 38.98% mothers practiced exclusive breastfeeding till 6 months of age, and 69.49% infants were exclusive breastfed till 4 months of age. Out of total 300 mothers, 116 (38.6%) introduced complementary feed before 6 months of age while 142 (47.3%) introduced at 6 months of age. 140 (46.6%) educated mothers started complementary feeding with homemade preparations while 115 (38.4%) started with market preparations. 33 (39.2%) mothers stopped breastfeeding at 6-9 months of age, and 33 (39.2%) mothers stopped breast feeding between 10 and 12+ months of age. A significant portion 274 (91.3%) of educated mothers did not have knowledge of IMS act. **Conclusion:** In the present study, majority of the mothers considered milk supplementation as complementary feeding and employed mothers preferred market preparations. Knowledge regarding IMS act was not satisfactory.

**Key words:** Complementary feed, Educated mothers, Exclusive breastfeed, Infant milk substitute act

Optimal infant and young child-feeding practices are crucial for nutritional status, growth, development, health and ultimately, the survival of infants and young children [1]. World Health Organization recommends exclusive breastfeeding (EBF) for the first 6 months of life, with the addition of complementary feeds at 6 months with continued breastfeeds until at least the age of 2 years [2,3]. Infants and young children are at an increased risk of malnutrition from 6 months of age onward when breast milk alone is no longer sufficient to meet all their nutritional requirements, and complementary feeding should be started. Initiating complementary feeds too early or too late can lead to malnutrition [4].

Proper breastfeeding and complementary feeding practices can prevent under five mortality by 19% [5]. Appropriate complementary feeding depends on accurate information and skilled support from the family, community, and healthcare system. Inadequate knowledge about appropriate food and feeding practices is often a greater determinant of malnutrition than the lack of food. Recognizing this to be a major public health problem, the Government of India, in 1992, enacted the

“milk infant substitutes (IMS), feeding bottles and infant foods (regulation of production, supply, and distribution) act, 1992” (IMS act). The relationship between maternal education and complementary feeding practices is complex. Education increases both ability to earn income and ability to appreciate the importance of complementary feeding. The former tend to mitigate against family food particularly in urban areas, and latter promotes the feeding practices through family foods [6]. Hence, the present study was planned to assess the complementary feeding practices and knowledge about IMS act among higher educated mothers.

## MATERIALS AND METHODS

This hospital-based cross-sectional, descriptive study was conducted in a Medical College Hospital of Rajasthan from January to December 2015. All consecutive eligible mothers fulfilling inclusion criteria were enrolled in the study till desired sample size of 300 was attained. The sample size was calculated at 95% confidence level assuming optimum child feeding practices in 57% of highly educated mothers as found in Rao et al. [7], at

the relative allowable error (precision) of 10% in the prevalence of optimum child feeding practices. Mothers having babies of age between 9 and 15 months and educated equal to and more than graduation level were included in the study after obtaining consent. Mothers who did not provide consent for study or whose children were severely ill were excluded from the study.

Data were collected using pre-designed, semi-structured questionnaire, administered by the investigators. These were interrogated to obtain the information regarding various factors responsible for not practicing timely, adequate, safe and appropriate texture complementary feed, education, socio-economic status (SES), working status, family type, and parity of mothers. The study also included information regarding, methods of feeding, duration of breastfeeding, and IMS Act. All the information was collected by interviewing the mothers in the hospital. All the feeding practices for children were elicited using the 24 h recall method except for initiation of complementary feeding or termination of breastfeeding for which history recall was used. SES was assessed using modified Kuppaswamy's SES [8]. Analysis of the data was done using SPSS software (version 19.0). Statistical test Chi-Square was used to find out the association of various feeding parameters.  $p < 0.05$  was taken as statistically significant.

The information gathered was used to measure various complementary feeding indicators.

1. EBF rate: All infants fed exclusively on breast milk from birth to 6 months of age, given no other liquids or solids other than breastmilk, not even water during that period.
2. Timely complementary feeding rate: To foster semisolid or solid foods from the age of 6 months.
3. Age of introduction: This implies that after 6 months, a child can eat soft and starchy food as cereals. By 9 months infant can be given chopped foods.
4. Taste consistency and texture of complementary foods: A child's first food should be based on cereals such as Suji or fruit-like banana which are soft, thicker than breast milk, bland in taste and mashed, or strained to homogenize.
5. Quantity and frequency of complementary feeds: From the age of 6 months to 1 year adequate serving of complementary foods should be given thrice a day and gradually the amount should be increased. If the child is not breastfed, complementary foods should be given 5 times a day.
6. Methods of feeding: Children can usually feed themselves by 1 year of age but they need supervision and help [9].

## RESULTS

The study sample comprised 300 educated mothers who had children aged between 9 and 15 months. Out of them, 109 (36.3%) were post-graduates and 191 (63.7%) were graduates. The SES of mothers showed that 33 (11%) mothers belonged to Class I (upper), 222 (74%) Class II (Upper middle), and rest of 45 (15%) belonged to Class III (Lower middle). Maximum numbers of mothers were homemakers (67.3%) as compared to employed

(32.7%). 185 (61.6%) mothers were living in a joint family and 115 (38.4%) in a nuclear family. 15 (5%) mother had 3 or more than 3 children, 68 (22.7%) had 2 children, and 217 (72.3%) had only one child (Table 1).

Out of the total 300 mothers, 129 (43%) had a female, and 171 (57%) had a male child. A maximum number of children (134, 44.64%) were between 9 and 10 months of age and 114 (38%) were between 13 and 15 months. A maximum number of children had birth weight between 2.0 and 3.0 kg (73%). The majority of the babies (113, 37.66%) were on breastfeeding and homemade preparation, and 84 (28%) babies had only complementary feed (Table 2).

In the present study, it was found that (38.98%) mothers practiced EBF till 6 months of age and 69.49% infants were EBF till 4 months of age. Out of 300 mothers, 116 (38.6%) introduced complementary feed before 6 months of age while 142 (47.3%) introduced at 6 months of age and 42 (14%) introduced after 6 months of age. Out of 116 mothers, 52 (53.6%) were employed and 64 (31.5%) homemakers. 140 (46.6%) educated mothers started complementary feeding with homemade, 115 (38.4%) started with market preparation, and 45 (15%) mothers introduced both market and homemade preparation. In the present study, 59 (60.8%) employed mothers introduced market preparation and 108 (53.2%) homemakers introduced homemade preparation (Table 3).

Most of the homemade preparations were Daliya (20.7%), Dal pani (20.1%), Soup (15%), Rice based (12.14%), Khichdi (7.1%), Suji (4.2%), and mashed banana etc., Most of the mothers 212 (70.6%) introduced milk supplementation as essential part of complementary feeding. The majority of mothers introduced complementary feeding after being advised by doctors (34%), close relatives and self 42 (14%). Among the mothers who started

**Table 1: Sociodemographic characteristics of study subjects (n=300)**

Subcategory	n (%)
Education	
Graduate	109 (36.3)
Post-graduate	191 (63.7)
SES*	
Class I (U)	33 (11)
Class II (UM)	222 (74)
Class III (LM)	45 (15)
Working status of mothers	
Housewife	203 (67.3)
Employed	97 (32.7)
Type of family	
Joint	185 (61.6)
Nuclear	115 (38.4)
Parity of mothers	
Para 1	217 (72.3)
Para 2	68 (22.7)
Para 3	15 (5)

\*Modified Kuppaswamy's SES scale, SES: Socio-economic status, U: Upper, middle, LM: Lower middle

market preparation, 23 (20%) belonged to Class I, 85 (73.9%) belonged to Class II, and 7 (6.1%) mothers belonged to Class III. Among the mothers who used homemade preparation, 8 (5.7%) were of Class I, 99 (70.7%) Class II, and 33 (23.5%) were of Class III (Table 4).

Among the mothers who used homemade preparation, 81 (57.85%) belonged to joint family, and 59 (42.6%) belonged to nuclear family. Among the mothers used market preparation, 65 (56.5%) belonged to joint family, and 50 (43.47%) belonged to nuclear family. In our study, 33 (39.2%) mothers stopped breastfeeding at 6-9 months of age and 33 (39.2%) mothers stopped breast feeding between 10 and 12+ months of age. Among employed mothers, the majority stopped breastfeeding before 9 months of age, only 4 (9.75%) breastfed for 10-12 months. Out

of 300 mothers, 216 mothers continued breastfeeding more than 1 year of age. Out of 216 mothers, 77 (35.6%) decided to practice breastfeed up to 18 months of age, 72 (33.3%) up to 24 months, while only 7 (3.2%) decided to breastfeed more than 24 months or till baby feeds.

286 (95.3%) mothers used to make every time fresh preparation and 14 (4.7%) mothers used old preparation. In our study, a significant portion (274, 91.41%) educated mothers did not have knowledge of IMS act. Only 13 (13.4%) among the working mothers had some knowledge. This difference was statistically significant ( $p \leq 0.05$ ).

## DISCUSSION

Most of the general characteristics of study subjects and children were comparable to Saxena and Kumar [10]. SES in present study was higher as compared to Saxena and Kumar. This might be due to difference in literacy status of the family. Majority of mothers were from local city where business opportunities were good.

In the present study, it was found that (38.98%) mothers practiced EBF for up to 6 months of age and 69.49% infants received EBF till 4 months of age. This may be due to increase literacy, awareness of advantages of breastfeeding, promotion of breastfeeding by media, banned pre cooked market preparations. Chitkara et al. found a total of 81.31% community babies and 62.82% hospital babies were solely breastfed at 1 month of age. By 6 months, this declined to 52.71% and 22.77%, respectively [11]. Ibhanesebhor et al. reported 58.6% mothers could solely breastfed their babies for first 4 months [12]. Hiwarkar et al. found EBF up to 4-6 months were practiced by 67% mothers [13].

Out of total 300 mothers, 116 (38.6%) introduced complementary feed before 6 months of age while 142 (47.3%) introduced at 6 months of age and 42 (14%) introduced after 6 months of age. Reasons for early feeding were mothers' perception of not having enough milk, resumption of job by mother, and baby used to cry a lot. Reasons for delayed feeding were regurgitation/vomiting by the child; mother did not know the exact timing of starting the complementary feeding, mother felt her milk was sufficient for the baby and elderly in the family suggested for starting complementary feeding at the age of 1 year. Rao et al. study showed that 10% of children were weaned prematurely [7]. A study from Delhi reported premature weaning in only 5.5% children which is lesser than the present study [4]. Saxena and Kumar reported that 70.1% cases started complementary feeding at 6 month of age. Reasons for this difference could be increased awareness in the population after deployment of ASHA workers and various educational program running for promoting feeding practices [10].

In our study, 59 (60.8%) employed mothers introduced market preparation and 108 (53.2%) homemakers introduced homemade preparation. These results were comparable with study done by Shrivastava et al. [14] and Saxena and Kumar. The reasons may be lack of time, earning capacity, extra responsibility for the employed mothers. Walia et al. noted that 88% of educated mothers introduced semi-solids before 6 months of age [15].

**Table 2: General characteristics of infant and children (n=300)**

Age distribution of babies (months)		
9-10	134	44.64
11-12	52	17.36
13-15	114	38
Sex of babies		
Male	171	57
Female	129	43
Birth weight (kg)		
<2	22	7.33
2-2.5	84	28
2.5-3	135	45
3-3.5	39	13
>3.5	20	3.33
Present feeding status		
Only complementary feed	84	28
Breast feed+homemade preparation	113	37.66
Breast feed+market preparation	76	25.34
Breast feed+combined preparation	27	9

**Table 3: Complementary feeding: Type of preparations used with working status**

Type of preparation	n (%)		
	Employed	Housewife	Total
Home made	32 (32.9)	108 (53.2)	140 (46.6)
Market	59 (60.8)	56 (27.5)	115 (38.3)
Combined	6 (6.18)	39 (19.2)	45 (15.1)
Total	97 (32.33)	203 (66.67)	300 (100)

$p \leq 0.05$  (highly significant)

**Table 4: SES and complementary feeding status**

SES	n (%)			
	Market preparation	Homemade preparation	Both	Total
I	23 (20)	8 (5.7)	2 (4.4)	33 (11)
II	85 (73.9)	99 (70.7)	38 (84.4)	222 (74)
III	7 (6.1)	33 (23.5)	5 (11.1)	45 (15)
Total	115 (38.33)	140 (46.66)	45 (15.01)	300 (100)

$p \leq 0.05$  (highly significant), SES: Socio-economic status



Hiwarkar et al. noted 67% at 4 months of age, 17% at 6-12 months of age.

The majority of mothers 149 (68.98%) were giving complementary feed before breastfeeding, 47 (21.75%) mothers after breast feeding, and 20 (9.25%) mothers gave complementary feed any time ( $p \leq 0.05$ ). Drewett et al. showed that complementary feeds may be given before, after, or with breastfeed as they do not influence 24 h breast milk intake and total energy intake [16]. In our study, 33 (39.2%) mothers stopped breast feeding at 6-9 months of age, and 33 (39.2%) mothers stopped breast feeding between 10 and 12+ months of age. Among employed mothers, the majority stopped breastfeeding before 9 months of age, only 4 (9.75%) breast fed for 10-12 months ( $p \geq 0.05$ ). Walia et al. noted 51.56% mothers discontinued breast feeding beyond 12 months of age [15].

Out of 300 mothers, 216 mothers continued breast feeding for more than 1 year of age. Out of these 216 mothers, 77 (35.6%) decided to practice breastfeed up to 18 months of age, 72 (33.3%) up to 24 months while only 7 (3.2%) decided to breastfeed more than 24 months or till baby feeds. Hiwarkar et al. showed that 76.1% mothers continued breastfeeding up to 24 months and 23.9% more than 24 months. There was no relation with working status of the mothers and continuation of breastfeeding. It means that there is a will to continue breastfeed, but different factors may affect continuation of breastfeeding. Even working mothers 4 (6.89%) wanted to continue breastfeed for more than 24 months of age as compared to 3 (1.89%) of homemakers. 286 (95.3%) mothers used to make every time fresh preparation and 14 (4.7%) mothers used old preparation. The study suggests that mothers who were giving homemade preparation were more likely to old one. Reasons may be that homemade preparation like Daliya, Khichdi are being prepared once and can be used for 2 to 3 feeding schedule.

## CONCLUSION

In present study, majority of mothers considered milk supplementation as complementary feeding and employed mothers preferred market preparations. Knowledge regarding IMS act was not satisfactory. Advice about breastfeeding and complementary feeding during antenatal checkups and postnatal visits might improve feeding practices. Awareness regarding IMS act is required.

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